

REMARKS

The present application was filed on April 6, 2000 with claims 1-38. Claims 1, 12, 13, 23, 30 and 31 are the independent claims.

In the final Office Action, the Examiner objected to claims 31, 35 and 36, allowed claims 12 and 30, and rejected claims 1-11, 13-29 and 31-38.

In view of the above amendments and the following remarks, Applicants respectfully request reconsideration of the present application.

The Examiner has objected to claims 31, 35 and 36 on the ground that certain limitations thereof were allegedly illogical. Applicants have amended independent claim 31 in a manner which is believed to address the objection. Applicants therefore respectfully request withdrawal of the objection. Applicants note that the amendment to claim 31 complies with a requirement of form expressly set forth in the final Office Action, while also presenting claims 31, 35 and 36 in better form for appeal. The amendment should therefore be entered in accordance with 37 C.F.R. §1.116(b).

With regard to the rejection of claims 1-3 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,734,656 (hereinafter "Prince"), Applicants respectfully submit that Prince does not disclose each of the limitations of independent claim 1. Independent claim 1 is directed to a modular switch. The modular switch as claimed comprises a plurality of backplane sub-buses, a plurality of cards which are each allocated one or more of the backplane sub-buses, and a controller which dynamically allocates the backplane sub-buses to the plurality of cards, based on bandwidth needs of the cards. An illustrative embodiment of the claimed arrangement is shown in FIG. 1 of the drawings, in which modular switch 20 comprises a plurality of cards 24, a plurality of sub-buses 22 and a controller 32.

The specification makes it clear that the term "sub-bus" as used therein refers to something other than a slot or set of slots of a time domain multiplexed bus. For example, the specification at page 1, lines 26-32 states as follows, with emphasis supplied:

In some switches, the bus is divided into sub-buses of the size of the maximal capacity of the cards. The sub-buses are allocated to the cards using time domain multiplexing. Such

multiplexing, however, is wasteful as it gives all the cards the some [sic] amount of bandwidth regardless of their needs. In addition, this solution adds delay to packets received by a card when it is not its turn to use the bus. In some buses which use time domain multiplexing, the bus is divided into slots, and each time a transmitter needs to transmit data it requests an amount of slots. This solution, however, is too slow and complex for fast switches.

The term “sub-bus” as used in the claims is therefore clearly distinct from a slot or set of slots of a time domain multiplexed bus, in accordance with the explicit teachings of the specification. Applicants have in effect defined the term “sub-bus” in their specification to exclude a slot or set of slots of a time domain multiplexed bus.

Applicants submit that the Prince reference fails to teach or suggest a plurality of backplane sub-buses, as recited in independent claim 1. Instead, Prince relates to a switching hub in which an asynchronous transfer mode (ATM) switch is utilized as a single backplane bus. Prince states that “the present invention allows time division multiplexing of the bus under programmatic control such that each module . . . is allowed a desired number of cell slots on the bus during which to transfer data, which the module has translated into ATM cells, across the bus” (Prince, Abstract, emphasis supplied). As indicated above, this type of time domain multiplexed bus is specifically addressed, and a given slot or set of slots thereof is explicitly distinguished from the term “sub-bus,” in the specification at page 1, lines 29-32.

The Examiner in the final Office Action at page 15, section 25, argues that cell slots of a time domain multiplexed bus such as that taught by Prince meet the “plurality of backplane sub-buses” limitation of claim 1. Applicants submit that this interpretation is directly contrary to the explicit description of the term “sub-bus” provided in the above-cited portion of the specification. Given the manner in which Applicants have described the term “sub-bus” in their specification, as being distinct from a slot or set of slots of a time domain multiplexed bus, it is improper for the Examiner to argue in a rejection of claim 1 that the claimed plurality of sub-buses are met by slots of a time domain multiplexed bus.

In summary, the present invention as recited in independent claim 1 calls for a plurality of backplane sub-buses, rather than a single time domain multiplexed bus such as that disclosed in Prince. The specification makes it abundantly clear that the term "sub-bus" as used in the present application is distinct from a slot or set of slots of a time domain multiplexed bus. Thus, it is respectfully submitted that the Prince reference does not disclose each of the limitations of independent claim 1.

Additionally, it is respectfully submitted that claims 2 and 3, which directly depend from independent claim 1, are patentable for at least the reasons that claim 1 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 1-3 under §102(b) is respectfully requested.

Each of claims 4-11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Prince and one or more other references. It is respectfully submitted that claims 4-11, which directly or indirectly depend from independent claim 1, are patentable for at least the reasons that claim 1 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejections of claims 4-11 under §103(a) is respectfully requested.

Claims 13, 14 and 16-18 stand rejected under 35 U.S.C. §102(b) as being anticipated by PCT WO 93/15464 (hereinafter "Porter"). However, like Prince, Porter is directed to a single physical bus. Therefore, Porter does not disclose "a plurality of backplane sub-buses" as recited in independent claim 13, for reasons similar to those described above with reference to independent claim 1.

Additionally, it is respectfully submitted that claims 14 and 16-18, which directly or indirectly depend from independent claim 13, are patentable for at least the reasons that claim 13 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 13, 14 and 16-18 under §102(b) is respectfully requested.

Each of claims 15 and 19-22 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Porter and one or more other references. It is respectfully submitted that claims 15 and 19-22, which directly or indirectly depend from independent claim 13, are patentable for at least the reasons that claim 13 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 15 and 19-22 under §103(a) is respectfully requested.

Claims 23-29 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,771,358 (hereinafter "LaBerge"). LaBerge is directed to a method which apportions bus bandwidth among bus requesters by assigning to each bus requester a bus bandwidth portion that is based on the bandwidth of the bus requester. More particularly, the LaBerge method "identifies a requester bandwidth for each of the bus requesters and sums the requester bandwidths to obtain a total bandwidth" and then "apportions the bus bandwidth among the bus requesters by assigning each bus requester a bus bandwidth portion that reflects the weighting value of the bus requester" (LaBerge, Abstract). Again, this arrangement involves a single physical bus without separately-identifiable sub-buses, whereas the present invention, as recited in independent claim 23, is directed to an arrangement involving a plurality of sub-buses. Therefore, it is believed that LaBerge does not disclose each of the elements of independent claim 23.

It is respectfully submitted that claims 24-29, which directly depend from independent claim 23, are patentable for at least the reasons that independent claim 23 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 23-29 under §102(b) is respectfully requested.

Claims 19, 31-33 and 35-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Porter. As noted above, Porter is directed to a single physical bus. Independent claim 31 has been amended herein to include the limitation "wherein the at least one controller is further configurable to allocate the sub-buses to the cards based on bus demand values of the cards." It is respectfully submitted that Porter does not teach or suggest at least this limitation of independent claim 31.

It is respectfully submitted that claims 19, 32, 33 and 35-37, which directly or indirectly depend from independent claims 13 or 31, are patentable for at least the reasons that independent claims 13 and 31 are patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 19, 31-33 and 35-37 under §103(a) is respectfully requested.

Claims 34 and 38 were rejected under 35 U.S.C. §103(a) as being unpatentable over Porter in view of admitted prior art or another cited reference. It is respectfully submitted that claims 34 and 38, which directly depend from independent claim 31, are patentable for at least the reasons that

claim 31 is patentable. Accordingly, in view of the above remarks, withdrawal of the rejection of claims 34 and 38 under §103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that claims 1-38 as amended herein are patentably distinct over the art of record and are in condition for allowance.

In the event that the Examiner believes that a telephone conference or a personal interview may facilitate resolution of any remaining matters, the undersigned may be contacted at the number indicated below.

Attached hereto is a marked-up version of the changes made to the claims by the present Amendment.

As indicated previously, a Notice of Appeal is submitted concurrently herewith.

Respectfully submitted,

A handwritten signature in black ink, reading "Joseph B. Ryan". The signature is fluid and cursive, with the first name "Joseph" and last name "Ryan" clearly legible. The middle initial "B." is smaller and positioned between the first and last names.

Date: March 13, 2003

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Enclosure(s): Notice of Appeal

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

31. (Twice Amended) A modular switch, comprising:

a plurality of communication cards;

a plurality of backplane sub-buses [which are used for communication between groups] each allocatable to one or more of the cards; and

at least one controller which is configurable to divide the cards into different numbers of groups, such that the cards of the different groups do not transmit data to each other, wherein the at least one controller is further configurable to allocate the sub-buses to the cards based on bus demand values of the cards.